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Eradication of Bovine and Avian Tuberculosis.—During the year ending June 30, 1927, 9,500,000 cattle were tested throughout the United States (joint auspices of federal government and States) and of this number 285,000 were found to be tuberculous. In all, since the beginning of the coöperative work in 1917, more than 39,000,000 cattle have been tested and more than 1,250,000 reactors found and slaughtered. On August 1 of this year there were 354 modified accredited counties covering over 261,750 square miles. Attention, although insufficient as yet, has been given to the question of avian tuberculosis, with the result that 16,500,000 fowls in over 200,000 flocks were tested during the year. Twelve thousand flocks, or 5.7 per cent, were found to be infected. Appropriations from states amounted last year to $13,000,000 and those from the federal government came to about half of this sum.—*Progress in Coöperative Tuberculosis Eradication Work, E. Lash, J. Am. Vet. Med. Ass., November, 1927, lxxii (n.s., xxv), 148.*—(*H. S. W.*)

Eradication of Bovine and Avian Tuberculosis in Michigan.—In 1921 area-testing was tried in Hillsdale County. With the coöperation of Federal, State and County officials, the 26,911 cattle in the county were tested in twelve days, and 618 reactors (12.3 per cent) were found. Tests were repeated after a few months. On the third test the incidence of tuberculosis in the infected herds was found to be 0.69 per cent, and still later it became less than 0.5 per cent. The price of cattle from the county rose, and a ready sale led to considerable smuggling of cattle from areas not under supervision, which led to a retesting in 1926, with the result that the incidence was about 0.95 per cent. It was surprising to observe that of the 196 farms where infection was found upon retesting no infected cattle had ever been found on 154, leaving but 32 farms on which bovine tuberculosis had previously existed. However, the fact of a high incidence of avian tuberculosis in the county, may have had something to do with this, and has led to considerable investigation into this newer

aspect of eradication of the disease as well as into the incidence of infection among hogs. Of 13,264 hogs shipped from the county for slaughtering, 2,219 (16.8 per cent) were found at inspection (they were not tested) to be tuberculous, indicating that the infection might not be from bovine bacilli. By tattooing the swine before shipment, it was determined that the infected swine had been shipped from 39 farms, 22 of which had had no reacting cattle upon them, 15 had had none since the first test, and 2 had no cattle. Tuberculin tests of the hogs of these farms disclosed an incidence of positive reaction of 17+ per cent, most of them reacting to avian tuberculin. An examination and test of over 15,000 fowls in one township of the county revealed an infection-incidence of 38 per cent. Removal of the infected animals did not clear up the situation, and the *tuberculosis-free-farm plan* was adopted, which meant accredited herds of cattle and hogs and accredited flocks. All reacting chickens were slaughtered and, with a single exception, showed tuberculosis. The occurrence of infected chickens and hogs on the same farm was frequently noted. It is concluded that the *tuberculosis-free-farm plan* is practicable, that many fowls with tuberculosis remain fat for a long time, and that tuberculin testing yields very accurate results; also, that all flocks in which infection is found should be condemned within a reasonable length of time, except, occasionally, pure-bred flocks. Elimination of only the reactors will not clear the flock as it will among hogs and cattle; double testing, that is, use of tuberculin made from bovine and that from avian bacilli, should be employed in testing swine; and avian tuberculosis is increasing at an alarming rate.—*Tuberculosis Eradication in Cattle, Swine and Poultry in Hillsdale County, Michigan, T. S. Rich, J. Am. Vet. Med. Assn., July, 1927, lxxi (n.s., xxiv), 451.—(H. S. W.)*

Control of Johne's Disease of Cattle.—For a long time Johne's disease has been associated with tuberculosis because of its chronic features clinically and of the discovery in the diseased areas of an acid-fast bacillus, thought to be related to the avian tubercle bacillus. The disease is a specific chronic enteritis affecting cattle chiefly, and other animals to a much less extent, and is characterized by great wasting of the body. There is no cough. Tuberculin, made from avian tubercle bacilli, has been used diagnostically in cattle with the disease, but, although apparently successful in some cases, it has not proved to be reliable. Recently a product called *Johnin*, made from cultures of the acid-fast Johne's bacillus found in the lesions, and apparently similar to tuberculin in nature, has yielded very gratifying results when used to diagnose Johne's disease, for which it is apparently specific. Having no influence upon normal cattle, it produces characteristic rises of temperature in those ill with Johne's disease. Several large herds have been tested with this product. In one of them, consisting of 207 head of valuable cattle, the disease had been endemic for several years and had caused the death of 27 cows during the last eighteen months before the test. Of these 207 cattle, 94, or 45 per cent, were found to be reactors and suspects. Two to 5 cc. of the *Johnin* was injected intravenously, and the temperature taken every half-hour for the following twelve hours. Most of the elevations occurred within the first six hours and 106°F. was not uncommon. Six of the reactors were slaughtered and all found to have Johne's disease. This study indicated that Johne's disease may be present in a herd, but may go unobserved for a considerable time; that it is desirable to do further study regarding the method of test and manufacture of *Johnin;* and that the disease is sufficiently important to warrant the interest and observations of veterinarians, so that some notion of the incidence can be had. It is of interest to note that practically all of the calves reacted to *Johnin*, but that many of the animals, one to two years old, failed to react, although they had been reared in the same barns. This would point to the possibility that they had been once infected and had overcome the infection. It would seem of the greatest importance to handle infected herds according to the strictest interpretation of Bang's method of isolation of tuberculous cattle, especially since Johne's disease appears to be increasing.—*Recent Developments in the Control of Johne's Disease, L. B. Ernest, J. Am. Vet. Med. Ass., September, 1927, lxxi (n. s., xxiv), 742.—(H. S. W.)*

Parasitic Tuberculoid Nodules in Lungs of Swine.—The lungs of swine occasionally present a miliary seeding, especially of the pleura, that is indistinguishable grossly from miliary tuberculosis. Histologically, the nodules in both lungs and pleura are found to be collections of lymphoid cells and resemble lymphosarcoma. They are always devoid of tubercle bacilli, but occasionally, especially in serial sections, fragments of partially disintegrated parasites or parasitic eggs and larvae may be detected. Identification of the invader has

not been possible heretofore because of the disintegrated state in which it is always found, but in these observations *Metastrongylus elongatus, Metastrongylus salmi* and *Choerostrongylus pudendotectus* have been recognized, the first-named being much the most common. The nodules are spherical, elevated, and easily removed with forceps, are yellowish at the centre but never calcareous, are not so firm and fibrous as tubercles, usually occur in smaller numbers, and are rarely seen in the lungs of swine older than one year.—*Parasitic Nodules Resembling Tuberculosis in the Lungs of Swine, L. E. Day, J. S. Bengston and H. B. Raffensperger, J. Am. Vet. Med. Ass., April, 1927, lxxi (n. s., xxiv), 39.—(H. S. W.)*

Human Organic Tuberculosis.—Gross and microscopic studies were made of the various organs in 106 autopsies on male patients who died of tuberculosis, for the purpose of studying the natural haematogeneous generalization of the disease. The spleen, liver and kidney were examined particularly, and in the whole series there were 58 cases in which there was no evidence of tuberculosis in either of these organs. In organic cellular reaction these organs resemble those of the rabbit closely, and, from a comparison of haematogenous dissemination in man with the results obtained in experimental animals, it was concluded that the human liver is as resistant to tuberculosis as the human spleen, the greatest number and size of tubercles in the latter organ being due to the difference in factors of deposition and oxygen tension of the source of oxygen. There is a low frequency of miliary involvement of the kidney, accounted for by the lesser deposition of bacilli from the blood-stream. Various clinical features and complications, such as pyopneumothorax, peritonitis and surgical tuberculosis, were considered for their bearing on the organic reaction. It was found that pulmonary cavities, spontaneous pneumothorax, empyema, peritonitis and mesenteric lymph nodes had no influence on the development of miliary tubercles in the spleen, kidney or liver, while surgical tuberculosis and ulcerative laryngitis were more prevalent in such miliary involvement. Amyloidosis was more prevalent in the organs of the negative cases. Ulcerative enteritis is not important in determining miliary involvement of the liver. The organic reaction to tuberculosis of these organs in the infant does not appear to differ appreciably from that of adult man. The child also appears to display a decided resistance to spontaneous superinfection. The predominant pulmonary localization of tuberculosis in man is explained by the favorable location of the lungs for aerogenous infection, the high oxygen tension of these organs being another important factor.—*Organic Tuberculosis in Man Analyzed from Postmortem and Experimental Data, H. J. Corper, J. Am. M. Ass., November 19, 1927, lxxxix, 1756.—(G. L. L.)*

Notes on Pulmonary Tuberculosis.—A series of cases of pulmonary tuberculosis are reported. *Summary: 1:* Tuberculous lesions in the lungs heal by absorption of infiltrations as well as by scar-tissue formation. *2:* Tuberculous cavities in the lung become very much smaller with improvement, and in some cases they apparently entirely disappear as far as the physical observations and the roentgen-ray examination can show. *3:* Artificial pneumothorax is often of great aid, even in cases of pronounced bilateral tuberculous disease. If the body is relieved of the tremendous poisoning from a massive lesion in one lung t may be able to cope successfully with a smaller lesion in the other. *4:* Most tuberculosis patients are apparently helped by a high, dry, sunny climate, such as that in Colorado, and in some cases such a climate may be the deciding factor in the recovery of the patient.—*Pulmonary Tuberculosis. Some Interesting Cases, S. W. Schaeffer, J. Am. M. Ass., June 18, 1927, lxxxviii, 1963.—(U. E. Z.)*

Pathogenetic Types in Tuberculosis.—The diagnosis as to activity and as to the type of lesions must be completed by recognizing definite types of evolution. The amount of signs and symptoms, commonly used to evaluate the degree of activity, does not furnish unequivocal standards for prognostication. The classification, presented here, is based chiefly on W. Neumann's teachings, which is an elaboration of the French school of Bard and Pierry, supplemented by the recent pathological work of Ranke, Aschoff and others, and by the immunological viewpoints of Pirquet, Hamburger and Hajeck. Two large groups of phenomena (*Formenkreise*), distinct in pathogenesis, clinical picture, course, prognosis and therapy, are distinguished. They must be considered as pathogenetic entities and not as different stages in one development. They are the phenomena of the primary infection and its consequences, and the phenomena of reinfection. The former is characterized by lymphogenous-haematogenous propagation, and results only rarely in an endobronchial invasion and thus in a secondary bronchogenic dissemination. The

latter comprises the "isolated phthisis" of Ranke with its predominantly intracanalicular propagation. A third group of processes may be described, comprising Ranke's secondary stage of generalization, in which either mode of dissemination may occur. The primary infection and its sequellae are briefly discussed as follows: The first infection—in the majority of cases pulmonary—may take place clinically unnoticed. In less favorable cases intense perifocal inflammation and overwhelming infection of the local lymph system occurs, with entrance of the virus into the blood-stream; this is associated with the production of strong toxin sensitiveness, which later develops slowly into a relative tissue-immunity manifested by the fact that haematogenous metastases cause more fibrotic than destructive changes. Clinically, this period ("proliferating primary complex" (Neumann)) is characterized by pronounced fatigue, irregular fever and by the physical signs caused by the enlargement of and perifocal inflammation around the hilum lymph nodes (hilum catarrh, Ranke). The parenchymatous focus may be demonstrable roentgenologically; localized or serohaemorrhagic pleuritis may occur. The most reliable and earliest sign of haematogenous spread is the splenic tumor, moderate in size and fluctuating with each new discharge of bacilli into the circulation. The pulmonary findings are scanty, at times noticeable only roentgenologically as small, frequently apical, disseminated foci of equal size (*tuberculosis miliaris discreta*, Bard and Neumann). Repeated localized disseminations produce the *phthisis fibrosa densa*, repeated generalized disseminations the *phthisis fibrosa diffusa*. In either case almost any extrapulmonary organ may be affected, the amount of damage depending on the degree of immunity. The following phenomena may be produced: serous meningitis or true basal meningitis, solitary cerebral tubercles, phlyctenules or tuberculous uveitis, Poncet's tuberculous rheumatism or destructive arthritis, *albuminurie pretuberculeuse* or progressive urogenital tuberculosis, polyserositis, plastic peritonitis, etc. The whole period of the primary infection is characterized by marked general symptoms and relatively few local findings. The foci of reinfection, frequently multiple, usually in the upper parts of the lung, are productive (acinous-nodose). Their lymphatic paths are not diseased. If they ulcerate, bronchogenic spread ensues, with cavitation and perifocal fibrosis in craniocaudal progression. Extrapulmonary organs become infected only by direct contact and not by systemic spread. Apical pleurisies, frequently recurrent, with marked general symptoms but without definite pulmonary findings, may be the clinical manifestations of benign, not ulcerating reinfections. The typical progressive pulmonary tuberculosis (*phthisis fibrocaseosa*) begins, as a rule, suddenly with marked malaise, exacerbations and remissions alternate, and locally the typical findings, with early tendency to cavitation, can usually be ascertained after the first or second attack. The treatment of choice is always pneumothorax. Caseous pneumonias, pleurisies and acute generalized miliary tuberculosis are explained as complications depending on the immunological condition of the host, massive infection and local conditions.—*Über die Notwendigkeit und Möglichkeit einer pathogenetischen Typendiagnostik der Phthise, W. Starlinger, Klin. Wchnschr., June 11, 1927, vi, 1129.*—(*M. P.*)

Evolution of Pulmonary Tuberculosis.—Until very recently the view that pulmonary tuberculosis developed almost regularly from an apical lesion was generally accepted. Hence the particular care that was given to the early diagnosis of apical foci. Such lesions of proliferative or cirrhotic nature, definitely distinguishable from insignificant areas of atelectasis or impairments of the percussion sound due to scoliosis, frequently affect the general condition of their bearers to a marked degree. But the opinion that such lesions develop only very rarely into the typical apical-caudal phthisis has been pronounced with increasing frequency. It is definitely established by now that this occurrence is relatively rare. A still rarer mode of evolution is the direct propagation from a primary focus by rupture of a caseated bronchial lymph node into a bronchus or into the blood-stream, followed by massive bronchogenic spread or disseminated hematogenous pulmonary lesions. Only the recent phase of extensive roentgenological studies has revealed the most important type of evolution. Ranke was the first to draw attention to the occurrence of resorptive tubercles around the primary focus and to the acute inflammatory alterations surrounding the latter and its lymphatic component. Redeker and others elaborated the diagnostic and clinical features of these phenomena, which, according to Ranke and Schmincke, are termed perifocal inflammation. These alterations cannot be identical with the well known exudative and pneumonic lesions, since they are frequently completely resorbed. Several clinical records and roentgenographs are published to substantiate this point. These foci are found in the

subclavicular region, near the hilum, and sometimes in the lower lobes. They are not typical for tuberculosis, according to classical physical signs, and the demonstration of tubercle bacilli in the mucoid sputum is frequently the only means of establishing the diagnosis. The formation of a cavity or the slow development of cirrhotic changes, suggest sometimes the correct diagnosis at a later stage. The striking incongruity of very slight and inconstant physical findings as contrasted with marked roentgenological signs is characteristic. The subjective symptoms are frequently slight, the temperature is usually subfebrile, the leucocyte picture is not characteristic. Lesions of this type (infraclavicular infiltrations, Assmann; early infiltrations (*Frühinfiltrate*), Simon) may either completely resorb, or they may rapidly excavate and represent, as such, the inception of typical pulmonary tuberculosis. This evolution, from early, usually nonapical infiltrations, and not from chronic proliferative or cirrhotic apical lesions, is the most frequent course of events. The decisive factor in this development is the cavity. The cavity in the early infiltration often shrinks, and most cases of healing of cavities probably belong to this type. Nevertheless, it is the cavity which constitutes the danger in regard to further developments. The focus around which the infiltrations develop may be a tuberculous tracheal or bronchial lymph node or an old parenchymatous focus. The focus proper may not be visible roentgenologically within the infiltrated area, but usually it becomes evident when the acute process recedes. The pathogenesis of perifocal infiltrations is reinfection. In the allergic soil, any reinfection produces an inflammatory reaction. This chain of events demonstrates the significance of repeated small reinfections. Essentially the same reactions will occur when endogenous reinfections, lymphogenous, haematogenous or bronchogenic, from an old bronchial lymph node, take place. The constitution of the patient, exudative diathesis, and nontuberculous allergic conditions must be taken in account. Temporary infiltrations of the same nature occur in the old processes, too. Examples are focal tuberculin reactions, infiltrations following haemoptyses and reactions due to insolation, mixed infections, and menstruation. It is important to emphasize that perifocal inflammations may be observed in every stage of development; for this reason the term "secondary infiltrations" should be abandoned. The early diagnosis of pulmonary tuberculosis is not any more concerned exclusively with apical lesions; the latter are important in regard to the disturbance of the general condition and because, infrequently, they may develop into chronic progressive tuberculosis. The incipient stage for the bulk of pulmonary tuberculosis is represented, however, by perifocal infiltrations, whose diagnosis must rely much on roentgenological and sputum examinations. The therapy of this incipient stage, as long as no cavity has formed, consists of complete rest and the exclusion of any stimulating agent, such as heliotherapy, extreme climates, tuberculin, etc. The Ponndorf treatment with its uncontrollable dosages is particularly perilous: it should be excluded from the treatment of any type of pulmonary tuberculosis. Under such complete rest, the perifocal infiltrations often disappear quite completely. If a cavity exists in the infiltrated area, pneumothorax should be induced immediately. Although such early cavities shrink not infrequently spontaneously, they always constitute a grave danger in the further evolution.—*Über die Entwicklung der Lungentuberkulose, v. Romberg, Klin. Wchnschr., June 11, 1927, vi, 1121.*—(*M. P.*)

Frequency of Combined Forms of Pulmonary Tuberculosis.—The difficulty in treating pulmonary tuberculosis lies in the variety of the forms of the disease. During the course of chronic acino-nodose disease there is frequently an acute period, with pyrexia and all the signs of progression. On the roentgen plate there can be found, besides the acino-nodose foci and cirrhotic areas, fields indicating exudative processes. On the other hand, during the course of acute disease, so frequent after an initial haemoptysis with primarily exudative processes, these can later change to the acino-nodose or even cirrhotic type. In treating a case it naturally is of great importance to determine which form predominates since the therapy must be guided by this.—*Über die Häufigkeit des Vorkommens von Kombinationsformen bei der Lungentuberkulose, Henius and Basch, Beitr. z. Klin. d. Tuberk., 1926, lxiii, 816.*—(*H. J. C.*)

Topography of Bronchial Lymph Nodes.—The author presents anatomical reconstructions of the thoracic lymph nodes. These lymph nodes for convenience are divided into six groups: (1) right and left bifurcation nodes, (2) right tracheobronchials, (3) right anterior hilar nodes (formerly called bronchopulmonary), (4) right posterior hilar nodes (interlobular, hardly considered earlier), (5) left anterior hilar, and (6) left posterior hilar (interlobar). In addition there are the aortic and *ductus Botalli* nodes. The right tracheobronchials and

right bifurcation nodes are of primary importance from the standpoint of size, diagnosis and disease frequency.—*Die Topographie der bronchialen Lymphknoten und ihre präparatorische Darstellung, S. Engel, Beitr. z. Klin. d. Tuberk., 1926, lxiv, 468.—(H. J. C.)*

Importance of Lymphatics in Pulmonary Infections.—The importance of the lymph vessels and their inflammatory thrombotic changes in the picture and course of inflammatory pulmonary diseases is demonstrated in foreign-body pneumonia and the acute bronchopneumonias of cattle, the "virus pest" of pigs, and the acute and chronic interstitial pneumonias of horses. These processes originate from the bronchioles, and spread along the peribronchial and perivascular lymph spaces. Only after fibrinous thrombotic occlusion, usually associated with high grade dilatation of the lymph spaces, does there occur infection of the pleura. There does not develop a pleurogenic, but rather a bronchogenic, pneumonia, which is also the case with processes of similar nature in man (chronic interstitial pneumonia). Like the involvement of the pleura, the peribronchial-perivascular and interlobar development of new connective tissue with contraction is also essentially of secondary nature. Especially significant are the oedematous swellings of the septa, noticeable in the acute bronchopneumonia of the horse and the haemorrhagic infiltrations of the interstitial tissues, especially in the "virus pest" of the pig.—*Vergleichend pathologisch-anatomische Studien über die Bedeutung der Lymphgefässe in den Lungen für die Verbreitung von Infektionserregern und Entzündungs vorgängen, A. Borm, Beitr. z. Klin. d. Tuberk., 1926, lxiii, 542.—(H. J. C.)*

Tuberculosis of Lymph Nodes at Venous Angle.—It was shown in earlier communications that not rarely the calcified lymph nodes tributary to a primary *Affekt* reveal fresh tuberculous changes. It was found that after the healing of the primary complex the tuberculosis can creep along in the lymph spaces and lymph nodes to the venous angle, and then rupture into the blood-stream and occasion haematogenous metastases. This progression of the tuberculous process in the lymph stream can proceed very slowly, and can extend over years with remissions but not necessarily clinical symptoms. Its clinical recognition may be impossible so that a tuberculous process in the lymphatic region is not suspected. In this way metastases can occur a long time after healing of the primary complex, which is then called "endogenous lymphoglandular reinfection" or "genuine exacerbation." In order to determine how frequently pulmonary tuberculosis is dependent upon such a reinfection careful studies were made of the lymph nodes in the venous angle in 100 cases dying of tuberculosis. The study covered the ages of 1 to 64 years, and included various pulmonary changes. No changes were found in the lymph nodes of the venous angle in 12 per cent of the cases, and in an additional 4 per cent no definite changes were determined. It is possible that even in these 16 cases serial section may have revealed tuberculous changes. Thus, 84 per cent of the cases examined revealed changes in the venous angle, with the possibility of rupture of the tuberculosis from the lymph channels into the blood-stream. The problem of reinfection in tuberculosis in its relation to phthisiogenesis is, however, not believed to be solved, and no definite statement is justified that the endogenous lymphoglandular reinfection plays a greater rôle than exogenous reinfection. It is possible that coincident exogenous and endogenous reinfections may occur.—*Die Veränderungen der Lymphknoten in den Venenwinkeln bei Tuberkulose und ihre Bedeutung. Eine Studie zur Frage der Reinfektion, A. Ghon, H. Kudlich and S. Schmiedl, Ztschr. f. Tuberk., 1926, xlvi, 1 and 97.—(H. J. C.)*

Epituberculous Infiltration of Lung.—The author describes 7 cases of "epituberculous infiltration." An onset with fever and cough appears to be as frequent as an asymptomatic beginning. The upper lobe is most frequently affected. The tuberculin reaction is always positive, and tubercle bacilli are rare in the sputum. The condition is most frequent at from two to five years. In the majority of cases there was infection outside the family, and no opportunity for superinfection. The course was characterized by the disappearance of the anatomical changes, retrogression proceeding from the periphery, and frequently resulting in calcified primary and lymph-node foci. Most of the children presented the exudative diathesis. A tuberculotoxic origin appears more likely than a bacillary origin. There seems to be a local predisposition of the tissues. The infiltrations are evidently part of an "active" tuberculosis and are to be regarded as such. The differential diagnosis, especially from caseous pneumonia, is frequently determined by the course of the disease. The blood picture rarely deviates from the normal, and may thus have some value in diagnosis. Atelectasis, slowly resolving influenza-pneumonia

and exudates offer diagnostic difficulties.—*Die Frage der Sogenannten epituberkulösen Infiltration der Lungen, H. Schlack, Beitr. z. Klin. d. Tuberk., 1926, lxiii,* 275.—(*H. J. C.*)

Anatomical Changes and Clinical Picture in Pulmonary Tuberculosis.—Issue is taken with the "qualitative diagnosis," at least in the form of its present interpretation. The emphasis laid upon exudative and productive changes is not considered of importance. In spite of the presence of the usual signs of exudative processes these may be absent quite frequently at postmortem. The inflammatory exacerbation or the more or less inflammatory phenomenon appears to be much more important and bridges the gap between the morphology and the clinique of pulmonary tuberculosis. Its occurrence in exudative or productive form is of no importance as compared with its frequency and character as a whole, whether purely specific or due to mixed infection. The roentgen picture indicates only the extent and external form of the disease.—*Pathologisch-anatomische Vorgänge und klinisches Bild der Lungentuberkulose, O. Ziegler, Beitr. z. Klin. d. Tuberk., 1926, lxv, 163.*—(*H. J. C.*)

Latent Tuberculosis.—Latent tuberculosis is at the same time a form and stage of bacillosis. It is a form of tuberculosis because it occasionally exists for a very long time and is indefinitely latent; it is a stage of the disease because it often leads to a definite bacillosis, breaks forth vehemently, and is difficult to cure. It is designated under a variety of names, such as *suspicious apices, suspected bronchitis,* or *impending tuberculosis.* These terms are either too precise or too vague, and are frequently inexact. The term, *latent tuberculosis,* is more limited and more comprehensive. There are four clinical types of latent tuberculosis: (1) the truly occult tuberculosis which is difficult to localize, (2) hilum lymph-node tuberculosis, rarer in adults than in children, (3) corticopleural tuberculosis, of pneumogenous or pleurogenous origin according to Letulle, and (4) pure latent pulmonary tuberculosis.—*La tuberculose latent, M. Loeper, Prog. Méd., December 25, 1926, no. 53, 2010.*—(*U. E. Z.*)

Clinically Latent Phthisis in Secondary Stage.—The view of Liebermeister, that tuberculotoxic-reacting individuals rarely develop a pulmonary tuberculosis, is opposed. From personal observation on 27 cases of pulmonary phthisis, it is concluded that a clinically latent course of the secondary stage appears to be fairly frequent. This clinical latent secondary stage in the cases studied by the author resulted in the development of phthisis within a period of 3½ to 9 years.—*Gehen der Lungenphthise Erscheinungen im Sinn des Liebermeisterschen Sekundärstadiums voraus? H. Sieper, Beitr. z. Klin. d. Tuberk., 1926, lxiv, 320.*—(*H. J. C.*)

Site of Primary Focus in Lung.—Of 2,649 tuberculous individuals a complete primary complex was found in 185. It was more frequent among females than among males, and in the right lung than the left. There was a decided increase in the number of primary foci from above downward.—*Über den Sitz des tuberkulösen Primärherdes in der Lunge, O. Wiese, Beitr. z. Klin. d. Tuberk., 1926, lxiii, 622.*—(*H. J. C.*)

Primary "Affekt" and Endocrine System.—The typical primary *Affekt,* seen at postmortem as a hard calcified focus, was found in only 34 per cent of the cases of pulmonary tuberculosis sectioned at the Jalta Institute for Tuberculosis, thus contradicting other figures. This is probably due to the acutely progressing late infection of this autopsy material. In these cases the primary *Affekt* does not resemble the usual childhood primary *Affekt,* with change to caseous necrosis and subsequent calcification, but is conspicuous for its lack of tendency to calcification and ossification. The diminished internal secretory function of the thymus is responsible for the lack of calcification of the later primary *Affekt* and of the regional lymph nodes. For the same reason there occurs no definite deposition of lime in the secondary reinfections.—*Primäraffekt und endokrines System, J. Kerner, Beitr. z. Klin. d. Tuberk., 1926, lxiv, 572.*—(*H. J. C.*)

Reactivation of Primary Foci.—Pulmonary tuberculosis in adolescents frequently originates as a unilateral infraclavicular focus in the lower portion of the upper lobe. Owing to its situation in the base of the lobe, such a focus of disease may in all probability be considered as a reactivated primary lesion. Such an evolution is frequently seen in an infant in whom the transition from primary lesion to subsequent pulmonary disease is continuous. Why the upper lobe is most frequently the site of such recrudescence of the primary infection is still an open question. In cases of retrogression of perifocal infiltration, however, the primary focus is to be found in the immediate vicinity or it is not demonstrable

at all (with an occasional exception). The flare-up of an old quiescent focus which occurs sometimes during tuberculin treatment gives an appearance similar to these reactivated lesions.—*Frühinfilträt und exaserbisende Primärtuberkulose, K. Diell, Deutsche med. Wchnschr., 1927, liii, 998.—(H. S. W.)*

Focal Reaction in Pulmonary Tuberculosis.—The importance of the focal reaction was emphasized by Koch and later by Turban. As specific moments are included, exogenously, the tuberculin reaction, and, endogenously, autovaccination following exercise, operative procedures and roentgen treatment of other tuberculous foci. As nonspecific moments of exogenous type are included protein reactions and drug reactions occasioned by alkaline mineral waters, abuse of alcohol, gold preparations, salvarsan and iodine, as well as fevers inducing reagents (Königer), roentgen, light and heat treatment, as well as climatic factors and seasonal changes. As nonspecific endogenous moments are considered all types of infectious diseases, haemoptysis with absorption of the blood protein, endocrine and metabolism variations as seen in puberty and pregnancy, and menstrual disturbances. Therapeutic reactions may be dangerous. In sanatorium treatment avoidance of harmful factors, and favoring of beneficial ones should be aimed at.—*Herdreaktionen bei Lungentuberkulose, A. Albert, Ztschr. f. Tuberk., 1926, xlvi, 262.—(H. J. C.)*

Apical Disposition to Tuberculous Disease.—The author differentiates three groups of apical disposition (1) a general apical disposition of the adult, also determinable in a certain percentage of haematogenous seedings (miliary tuberculosis); (2) an age disposition (an increase during the ages of 16 to 20 years, and rare in old age or in the child); and (3) an increased disposition in those with the *habitus phthisicus*. The isolated character of the apical lesion is due to mechanical factors. In this regard, the ideas of Beitzke and others, concerning a diminished apical ventilation and circulation, are important. Here also may be classed Tendeloo's teaching as to the respiratory mechanism (ventilation of the upper parts of the lungs by thoracic and the lower parts by diaphragmatic breathing), and the view of Orso as to the action of the diaphragm upon the lung. The tuberculosis of the adult is initially limited to the branches of the upper-lobe bronchus. The horizontal branch becomes affected only in the presence of fibrosis and an altered position of the horizontal bronchus. The dorsal bronchial branches differ from the other branches in their direct relation to the diaphragm, and they are favorably disposed for tuberculosis in the *habitus phthisicus*. Likewise, the asthenic and enteroptotic constitution, and a temporary apical disposition during periods of illness, with consequent emaciation and diminished filling of the abdominal space associated with muscular weakness, are decisive moments. In the child the entire form of the lung and body plays a decisive rôle, while in the aged the round back and the contour of the thorax are important.—*Über das Wesen der Lungenspitzendisposition zur Tuberkulose-Erkrankung, H. Loeschcke. Beitr. z. Klin. d. Tuberk., 1926, lxiv, 344.—(H. J. C.)*

Infraclavicular Foci of Assmann.—During the stress of war and even now in the period of inflation, when there must have been a lowering of general bodily resistance, there has appeared an unusual type of pulmonary tuberculosis in young adults that is characterized by being situated below the clavicle without involvement of the apex. The patients at first suffer but few symptoms and these are of a very general nature, and physical examination yields but little. The roentgenological plate, however, reveals roundish, sharp, localized shadows situated just below the clavicle. They tend to lie laterally and frequently show a cavity. They occur so frequently as to bring into question the teaching that all pulmonary tuberculosis begins in the apex. The basis for the situation of the disease is anatomical, and one may believe that the relationships of bronchi, etc., are such as to favor the adherence of tubercle bacilli to this situation. Many of these foci are new, and represent new or recent infections, and doubtless have nothing to do with childhood infection. They nearly always, within six months of their first detection, proceed to progressive disease, doubtless through the aspiration of tubercle bacilli. But, although this occurs, most of the patients do well with adequate treatment, whether the latter be carried on with or without artificial pneumothorax.—*Ueber die infraklavikulaeren Lungeninfiltration im Beginn der Tuberkulose jugendlicher Erwachsener und ihr Schicksal, H. Assmann, Deutsche med. Wchnschr., May 6, 1927, liii, 781.—(H. S. W.)*

Infraclavicular Foci of Assmann.—Among 739 female sanatorium patients, roentgenologically a typical infraclavicular focus of Assmann was found 19 times (2.5 per cent), and in 15 of these the source

of infection was determined. The Assmann foci are neither associated with a definite age-period or definite walk of life. They represent exogenous, aerogenic reinfections. Their further development can be extraordinarily manifold.—*Beitrag zu den Assmannschen infraclaviculären Krankheitsherden, Warnecke, Beitr. z. Klin. d. Tuberk., 1926, lxiv, 287.*—(*H. J. C.*)

Foci of Assmann.—While the author in his first contribution favored the view that the infraclavicular infiltration was primary he believes now that it represents more likely a reinfection. A complete differentiation, however, is not yet possible. However, he emphasises the significance of the infraclavicular infiltration in phthisiogenesis and, therefore, in therapy and the tuberculosis campaign.—*Über die isolierten infraclaviculären Infiltrate nebst Bemerkungen zu der gleichnamigen Arbeit von Redeker in Band lxiii, H. 4/5, dieser Zeitschrift, H. Assmann, Beitr. z. Klin. d. Tuberk., 1926, lxiv, 578.*—(*H. J. C.*)

Clinical Features of Infraclavicular Foci of Assmann.—Assmann reported clinical studies on freshly infected adults. These infections had a characteristic roentgenological appearance, namely an isolated infiltration in the subclavicular region. This author thought that they were caused by exogenous reinfections in a body which had lost practically all allergy acquired by a healed childhood infection. Redeker interpreted analogous findings as products of a highly allergic condition in the early secondary stage (Ranke). Hübschmann agrees essentially with Redeker, but stresses more the importance of exogenous inhalation infections. Redeker reported on the further development of these infiltrations; they may excavate, and the cavity may heal or lead to a progressive tertiary phthisis. Or complete resorption without cavitation may occur. Four sets of clinical observations are reported in which the incipient phase of infraclavicular infiltrations could be studied. The first patient was a girl, 21 years of age, who had calcified pulmonary foci, a very low tuberculin allergy, and no signs or symptoms of active tuberculosis. The allergy increased very much within three months, during which time the girl took care of her actively tuberculous sister. Two weeks after a strongly positive tuberculin skin test she fell acutely sick, and had elevated temperature for six days. Five weeks later the X-ray picture showed a typical infraclavicular infiltration, physical signs were not characteristic, and the general condition was only slightly disturbed. The disease developed into a nodose-cavernous phthisis with apicocaudal progression. The second case was that of a healthy medical student with low allergy. Seventeen days after the tuberculin test he developed a low-grade temperature. Roentgenologically he had at this time an infraclavicular infiltration which resorbed completely later on. Two further patients are reported in whom essentially the same course of events, —sudden development of an infraclavicular infiltration in a previously normal lung,— was observed. These four cases are of particular interest because they had been examined clinically and roentgenologically shortly before the onset of the disease and had not shown any pulmonary changes. The general condition in all four patients was only slightly impaired, and the physical signs were so noncharacteristic and scant in comparison with the X-ray findings, that only the latter and bacteriological examinations made possible a correct diagnosis. The differential diagnosis between these early infiltrations and caseous pneumonia is helped by the X-ray picture, which shows in the former diffuse and homogeneous shadows, and in the latter a shadow with more detail, such as denser spots and bands. In the former the tuberculin allergy is high, in the latter it is low. Infraclavicular infiltrations have never been available for histological studies.—*Zur Klinik der infraclaviculären Infiltrationen, Unverricht, Klin. Wchnschr., July 30, 1927, vi, 1468.*—(*M. P.*)

Basal Pulmonary Tuberculosis.—In contrast to the adult apical fibroid tuberculosis which appears in areas of fan-like arrangement near the apices, in which scar-tissue is laid down, with frequently associated secondary areas of caseous bronchopneumonia near the base, the lesions of basal tuberculosis do not as a rule lay down scar-tissue, absorption is the exception, cavitation is the rule, and in most cases the prognosis is bad. These are not aspiration pneumonias, but the lesions must be blood-borne or the result of massive infection through the respiratory tract. Lesions of the gastrointestinal tract, and the genito-urinary and osseous systems may furnish blood-borne infection, and in 19 autopsies such lesions were found associated with these basal types, warranting careful search for tuberculosis in other parts of the body when basal tuberculosis is diagnosed. Of 60 cases of basal tuberculosis studied, the lesion was found to be quite common in negroes, and almost uniformly fatal in that race. In only 8 cases was there any hope for recovery, seven of these being white. Tuberculous lesions were found in other parts of the

body in 44 cases, the most frequent being adenitis, bone and joint lesions and pleuritis.—*Basal Tuberculosis, K. Dunham, J. Am. M. Ass., November 5, 1927, lxxxix, 1573.*—(*G. L. L.*)

Localization of Tertiary Tuberculous Foci in Lungs.—The localization of pulmonary tuberculous lesions in 187 cases were studied. Of these, 112 had a single apical focus, 89 being in the dorsal aspect and the remainder in the lateral and medial bronchial branches. There were only 6 cases of isolated foci in the subapical bronchus. In 99.46 per cent the foci were in the posterior branches. Of these 99.45 per cent were localized in the upper lobe, and of these 96.76 per cent were apical, with 60.54 per cent purely apical and 39.46 per cent subapical and horizontal tertiary tuberculous foci. In the posterior region there was a greater tendency toward healing, while foci in the anterior region tended more to destructive changes. Pigment streaks were predominantly noticed in cases that had not existed for a long time. Four to five weeks of bed-rest sufficed to eliminate them.—*Die Lokalisation der tertiär-tuberkulösen Narben in den Lungen, zugleich ein Beitrag zur Pigmentsstreifenfrage, B. Zeiss, Beitr. z. Klin. d. Tuberk., 1926, lxiv, 463.*—(*H. J. C.*)

Capillaries and Giant Cells in Tuberculous Foci.—The study is divided into two parts, the first considering the behavior of the blood vessels in pulmonary tuberculous foci, and the second the histiogenetic relations between the giant cells and the capillaries. Numerous capillaries are to be found in the inner layers of tuberculous foci. These are not the result of an overgrowth of capillary-containing tissues into the tubercle, but rather old changes with definite encapsulation and fibrous transformation of the foci. Even the "specific capsule" of older primary *Affekts* and "superinfection foci" contain capillaries. Blood-filled capillaries in the region of caseating foci indicate the marked resistance of vascular tissues toward the destructive process, which is probably explained by the presence of flowing blood. Giant-cell formation is the expression of an increased irritation and a tendency toward new cell-formation. An origin of giant cells from vascular processes seems most likely, although it is possible that this may not be the only method of giant cell formation.—*Beiträge zur pathologischen Anatomie der Tuberkulose, II. Wurm, Beitr. z. Klin. d. Tuberk., 1926, lxiii, 977.*—(*H. J. C.*)

Pulmonary Cavities.—Laennec failed to recognize the pulmonary cavity as an important lesion in later evolution of tuberculosis. For him, his contemporaries and a long line of his successors it indicated the beginning of the terminal phase of the disease. He observed in the pathological anatomy of the cavity everything that objective examination could permit at that time. The relationship of the various phenomena, as he described them, may be disputed at the present time, but only with great hesitation, because many new methods of investigation have been discovered which allow the various steps in the development of the disease to be better understood. The finer interpretation and appreciation of auscultatory sounds was impossible for Laënnec, due to the fact that the sciences of acoustics, experimental physiology and radiography were not developed at that time. He not only created the modern methods of clinical exploration, but he brought together various sciences in order to establish a solid foundation for his own researches. It was an almost superhuman task for him to derive so much from his studies and to have so applied his methods that they have been closely adhered to ever since.—*L'étude des cavernes pulmonaires de Laënnec a nos jours, M. P. Ameuille, Prog. Méd., December 11, 1926, no. 51, 1933.*—(*U. E. Z.*)

Pulmonary Cavities.—A case is reported in which a large cavity in the right middle field constituted the first sign of pulmonary tuberculosis. This cavity "healed" after six weeks of pneumothorax treatment. It is not justifiable to call all cavity-like appearances in the roentgenograph which disappear in a short time "pseudocavity," as is advocated by H. Ziegler. The importance of immediate collapse therapy in early cavities is stressed.—*Aphoristische Bemerkungen über Kavernen, A. Wolff-Eisner, Wien. klin. Wchnschr., June 16 1927, xl, 780.*—(*M. P.*)

Early and Late Cavities.—The early cavity (*Frühkaverne*) is represented by the cavity that is formed in the infraclavicular infiltration. According to its pathogenesis it is almost always single. Since it is a phenomenon of the early reinfection period, it is most frequently seen between the ages of 20 and 30. On account of the frequent absence of cavity signs and on account of the sometimes rapid and complete disappearance, roentgenologically, of the cavity the diagnosis has frequently been doubted. Early infiltrations may come to a standstill and show processes of demarcation and cirrhosis. Then, a secondary process of

cavitation may occur. Cavities of this origin may be contracted or enlarged by the surrounding fibrosis; in neither case can a complete healing of the cavity be expected. The cavity of the latter type develops within a preformed capsule and is due to the breaking down of a well resisted chalky focus. Accordingly the surrounding tissue does not show any infiltration. The liquefaction of the centre may be caused by an intercurrent infection; the resulting cavity is usually small and thick walled. Late cavities (*Spätkavernen*) develop in patients in whom a rather stationary cirrhotic process has existed, sometimes for many years. Their inception is marked by the sudden onset of haemoptysis or purulent bacilliferous sputum and fever. The general condition is usually very good. Physical examination reveals usually the signs of a long-standing process, X-ray pictures demonstrate cirrhotic alterations. Thoracoplasty is indicated in the case of late cavities. The differentiation of the two different types does not depend so much on the original anatomical process as on the pathogenetic phase of the whole process of the disease.—*Über Früh- und Spätkaverne und ihre Prognose, H. Kausch and R. Klingenstein, Klin. Wchnschr., June 11, 1927, vi, 1126.*—(*M. P.*)

Localization and Drainage of Pulmonary Cavities.—Among 25 cases of cavernous phthisis there were 15 with large isolated cavities, with more or less poor drainage in the upright position of the body or in the usual recumbent position in bed. It was found that, with the usual productive character of the pulmonary process, the upper part of the cavity was more or less in the stage of granulation and evacuation, or appeared to be undergoing healing, while the non-drained bottom of the cavity showed widespread caseation and liquefaction. This led to the recommendation that an improved emptying might be attained by proper postural drainage, which would also favor healing. To attain the best therapeutic effect it is necessary to study the most beneficial posture of the body in the individual case. The remaining 10 cases of the total 25 were progressive exudative processes, in which drainage did not prove to be of such great significance. In these cases the rapid progressive phthisis stood out prominently and no therapy appeared to arrest it.—*Über die Lokalisation phthisischer Kavernen, ihre Drainierung durch das Bronchialsystem und die Möglichkeit einer Besserung des Abflusses durch Körperlagerung, R. Steinert, Beitr. z. Klin. d. Tuberk., 1926, lxiv, 581.*—(*H. J. C.*)

Contraction of Tuberculous Pulmonary Cavities.—Even large cavities can perceptibly contract within a period of 6 to 8 months, as is evident from the roentgenographs shown from 5 cases. Complete healing was, however, not observed. There was entire agreement between the clinical and roentgenological findings in these cases. Such findings alter the accepted prognosis of cavities, but they still remain a serious complication for which the basic character of the tuberculosis is a decisive factor. If the tuberculosis is of productive, cirrhotic character, or if it is being transformed from an exudative into a productive form, the contractions are possible. The number of these favorable cavity cases is low, when compared with the total cases.—*Spontane Schrumpfungsmöglichkeit von Kavernen, H. Alexander, Beitr. z. Klin. d. Tuberk., 1926, lx, 119.*—(*H. J. C.*)

Emphysematous Blebs.—A bleb is caused by the rupture of pulmonary alveoli immediately beneath the pleura which allows the air to escape in the pleura and causes it to separate from the underlying alveoli, thus forming a thin-walled space situated outside the lung itself. A bulla is situated within the lung, caused by distended alveoli, which may eventually result in the destruction of interalveolar walls; it may protrude over the surface of the lung. The alveoli underlying a bleb which has existed for some time are compressed by the air contained in the bleb. The alveoli surrounding a bulla are distended. The histology of a bleb, found in a lung of a patient who had suffered from chronic asthma and died during an attack, is described in great detail.—*A Further Study of Emphysematous Blebs, W. S. Miller, Am. J. Roentgenol. & Rad. Therapy, July, 1927, xviii, 42.*—(*M. P.*)

Tuberculosis an Inflammation.—Tuberculosis is considered as an inflammation which cannot, however, be actually evaluated, but is divided into its most important phases of circulatory disturbances and exudation on the one hand, and tissue and vascular proliferations on the other. In principle, this can be divided into an exudative and a productive phase. During the exudative stage there is still possible a *restitutio ad integrum*, which is, however, not possible when the productive phase has occurred. Tuberculosis belongs primarily among the inflammations, and there are, therefore, no two forms of tuberculosis. The tuberculous process is, in principle, single and an inflammatory one, in which there occurs tissue destruction followed by circulatory disturbances and exudation.

These are found in every stage of the disease, even in the hepatic miliary tubercle. Tuberculous processes in the lung can completely resolve so long as they have not been transformed to the productive stage or have not gone to caseation. Fruitful fields of investigation are still available in the study of the allergic inflammation of a tuberculous process. The relation between exudative and productive changes in their various forms can only be explained by this means.—*Die Tuberkulose als Entzündung, Hübschmann, Ztschr. f. Tuberk., 1926, xlvi, 49.*—(*H. J. C.*)

Exudative Pulmonary Tuberculosis.—This is an elaboration of the earlier work by Turban and Staub on the healing of cavity. In their cases, the predominantly perifocal inflammatory cases, as considered by Lydtin, were not being dealt with, nor the isolated infraclavicular cavities of Redeker, but rather the markedly progressive predominantly tertiary processes. These cavities always are associated with severe complications, which make the prognosis less favorable. Five illustrated cases vouch for the healing of the severe exudative caseoproliferative processes. Infraclavicular infiltrations are not primary foci. Bronchopneumonic foci are always severe complications, regardless of whether they are of haematogenous or bronchogenic dissemination. In bilateral cases conservative therapy and high-altitude climatic treatment are indicated.—*Kasuistisches und Kritisches aus dem Gebiet der exsudativen Lungentuberkulose, H. Staub, Ztschr. f. Tuberk., 1926, xlvi, 357.*—(*H. J. C.*)

Caseous Pneumonia with Negative Sputum.—In a patient with a long-standing caseous pneumonia and protracted fever the expectorated material contained only pneumococci. The sputum was abundant, and consisted of greenish pus. At autopsy a large pulmonary cavity surrounded by dense caseation was found. It is unusual to find a tuberculous pneumonia with expectoration in which the tubercle bacillus was never demonstrated.—*Pneumonie caséeuse avec expectoration non-bacillifère, Chevallier, Meeting, Soc. Méd. d. Hôp., April 8, 1927, reported in Prog. Méd., April 30, 1927, no. 18, 680.*—(*U. E. Z.*)

Origin of Rice Bodies in Tuberculosis.—A young woman developed a painless swelling, which persisted, on the flexor surface of the wrist. Nearly three years later a similar swelling appeared on the other surface of the hand over the fifth metacarpal. On the day before examination (when the second swelling had been present about three months) the patient sustained a slight injury to the hand and the next day showed a fracture, apparently from compression necrosis. Upon removal of the tumors they were found to be virtual sacs of so called "rice bodies," which yielded tubercle bacilli upon staining and caused tuberculosis in guinea pigs when inoculated. The bodies had fibrous walls and within the wall of the tumor-sac was found a tubercle having a structureless centre quite like that of the rice bodies. It appears that rice bodies are composed of tuberculous material, that they are attached in the beginning to the wall of a tuberculous sac, and that they are probably formed from the centre of a tubercle.—*The Formation of "Rice Bodies" in Tuberculosis, M. H. Rogers, J. Bone & Joint Surg., October, 1927, ix (o.s., xxv), 636.*—(*H. S. W.*)

Calcified Foci in Adults.—The diagnosis of X-ray shadows of calcified areas during life was checked postmortem. Of 1,336 cases examined, there were 779, or 58.3 per cent, with calcified foci. Calcified foci were found more frequently in women than in men. Multiple calcified foci were found in 28.2 per cent of the cases, being present in 28.5 per cent of nontuberculous and 27.6 per cent of tuberculous cases. The presence of multiple calcified foci exerted no influence upon subsequent disease. The relative number of cases with multiple calcified foci increased with age, and, again decreased at a later period. Reinfection was aerogenic. Pulmonary apical catarrhs had practically nothing to do with the apical calcified foci. Of the family contacts with multiple calcified foci there were 47.5 per cent as compared to an expected 29.2 per cent.—*Über isolierte Kalkherde bei Erwachsenen, Ickert, Beitr. z. Klin. d. Tuberk., 1926, lxiii, 483.*—(*H. J. C.*)

Pulmonary and Thoracic Retractions.—In the past the phenomena of retraction generally have been deprived of the light of the X-rays and knowledge in the living of the state of the pleural layers. To the modifications in the stage of the lung, pleura and chest-wall have been added a more precise knowledge of the signs of cardiac, mediastinal and tracheal attraction, in varying degrees. In certain cases the beginning of retraction of the chest (especially in young subjects) is entirely dependent on the process of pulmonary parenchymal sclerosis, without the intervention of any pleural adhesions. A series of roentgenographs is presented, illustrating (1) spontaneous pulmonary and thoracic

retraction, (2) spontaneous pulmonary retraction, treated, and (3) provoked pulmonary and thoracic retraction. While such retractions are indicative of a fibrotic or healing tendency, it is evident that active evolution can still go on despite their presence, and new localizations develop. While auscultatory signs have their importance they may be misleading. Repeated and controlled sputum examinations are essential and a most important guide as to actual healing. Often healing must be aided by such adjuvant measures as collapse therapy. Pneumothorax may often, contrary to expectation, be easily induced. Many patients cannot afford to wait for the long slow process of natural retraction and effacement of lung tissue to run its course and, if let go, they are a menace to their environment. Marked cardiac and mediastinal displacements have been observed to disappear following the induction of pneumothorax and the sputum to become negative after a few insufflations. Following severe pleurisy in the course of pneumothorax, striking retractile changes in lung, pleura and chest-wall may be noted, which are advantageous in assisting immobilization after the pneumothorax has to be abandoned, and go hand in hand with progressive cicatrization. It is a question whether it is wise to oppose this process. *Conclusions: 1:* Observation records cures by means of pulmonary and thoracic retraction, which are indicative of sclerosis and cicatrization. *2:* In certain less favorable cases the process falls short of cure and is powerless to produce it. *3:* These forms are often very amenable to pneumothorax treatment. *4:* If tubercle bacilli are constantly present in the sputum, even though retraction is marked, intervention should be practised. *5:* Pneumothorax may ultimately produce effects comparable to those encountered in naturally cured cases. *6:* When pleurisy occurs it results in pulmonary and thoracic retractions which assist ultimate cure, sometimes realizing veritable natural thoracoplasty.—*Contributions à l'étude des rétractions pulmonaires et thoraciques, U. Guinard and V. Hinault, Rev. d. l. Tuberc., August, 1926, vii, 553.—(A. P.)*

Unilateral Pulmonary Shrinking.—There are a number of unilateral pulmonary contractions due to nontuberculous conditions, such as hereditary aplasia, disease processes of early childhood as bronchitis with bronchiolitis, pleuritis, bronchial stenosis, inflammation of the parenchyma, healed abscess cavities following the aspiration of foreign bodies, chronic pneumonias and syphilis. In congenital aplasia there is always a contrast between the general well-being and the severe pulmonary findings. An asymmetry of the thorax suggests a contraction developed at a later age. The pulmonary findings are rarely of differential diagnostic significance. To a certain extent an apical site indicates tuberculosis. The tuberculin reaction is of definite diagnostic value if it is unquestionably negative.—*Beobachtungen über ätiologisch schwer zu deutende, einseitige Lungenschrumpfungen, W. Kühl, Beitr. z. Klin. d. Tuberk., 1926, lxiii, 539.—(H. J. C.)*

Mixed Infection in Pulmonary Tuberculosis.—The author describes the fluorescine-methylene blue method for the determination of tubercle bacilli in the sputum, which he considers the most satisfactory in that other bacteria can thus be differentiated. In the therapy of mixed infection he recommends inhalations of menthol and formalin-containing tinctures, or with weak chlorine vapors, or the internal use of dilute Lugol's solution.—*Zur Frage der Mischinfektion bei der Tuberkulose, E. Czablewski, Ztschr. f. Tuberk., 1926, xlv, 477.—(H. J. C.)*

Physiological Pleural Pressure.—Bernou and Cardis reply in this article to recent criticisms by Rist and Strohl of a preceding communication. They attempt to make a distinction between (1) pleural pressure before any puncture or insufflation, and (2) with puncture, before or after insufflation; and refer to Brauer and Roth's formula, based on experiments to determine the external traction necessary to pull apart the pleural layers. They defend their conception of multiple indeterminate factors which may influence pleural pressure *physiologically*, which word they emphasize repeatedly. They refuse to believe that Rist and Strohl's studies of the resorption of gas from a pneumothorax and their explanation for the approximation of the pleural surfaces under these conditions explain the phenomena of normal contact of these surfaces when the pleura has been unopened.—*Que doit-on entendre par pression pleurale physiologique, A. Bernou and F. Cardis, Rev. d. l. Tuberc., June, 1926, vii, 454.—(A. P.)*

Intrapleural Pressure.—Rist and Strohl refer to their studies published some time back, which have recently been called into question by Bernou and Cardis, who appear to misapprehend them, and invoke other considerations which tend to obscure the essential facts. Rist and Strohl in these previous experiments clearly showed that if there be introduced any gas between the

pleural layers it will tend to disappear according to the physical laws of diffusion, and that these same laws fully explained the maintenance in contact of the pleural surfaces. The fact that the serous surfaces are covered with a thin layer of synovial fluid does not essentially alter the situation. The laws of diffusion are, therefore, the important factor. Bernou and Cardis think that adhesions, pulmonary elasticity, etc., must be considered, grouping all these under the term "forces of unknown nature." This ignores the observations of diPietro on pneumoperitoneum. "Adhesion" will not explain, as Von Wyss has shown, the contact of the pleural surfaces, while pulmonary elasticity is a force which tends to break the contact of these surfaces. This rôle has been well explained by Carson-Donders. Rist and Strohl, in their article referred to, showed that 'the sum of the partial tensions of the gases in the intrapleural medium with which gaseous exchange takes place is equal to 90.69/100 of atmospheric pressure, or to a pressure equivalent to 936 cm. of water. The difference between this and atmospheric pressure is 97 cm. of water, and this is the reason for the contact of the pleural surfaces. If the intrapleural pressure could be lowered beyond this the gases dissolved in the blood or lymph would erupt into the pleural space. But, even during deepest inspiration, this point is never reached, 60 cm. of water below atmospheric being the lowest intrapleural pressure which can be obtained. This same diminished partial tension of the gases in the intrapleural medium is the reason for the absorption of a closed pneumothorax. To substitute vague notions for these facts is to cause confusion. Bernou and Cardis also misuse the term "intrapleural pressure." To say, as they do, that "the effective intrapleural pressure is equal to atmospheric pressure" is to go contrary to established facts and bid goodbye to principles of elementary physics, a grievous error.—*À propos de la pression intrapleurale, E. Rist and A. Strohl, Rev. d. l. Tuberc., February, 1926, vii, 75.—(A. P.)*

Absorptive Power of Pleura.—Normally the serous membranes do not absorb or secrete to any great extent. Faraboeuf has found the pleura to possess the greatest absorptive power of any serous organ, and since Magendie's studies on the absorption of strychnine, numerous authors have studied the absorption of gases, saline or colored solutions, albuminoids and oils. *Absorption or Resorption of Gases:* Cooper observed haematosis to take place through the visceral pleura of an exposed lung. Davy, a century ago, conceived the idea of determining the chemical composition of an intrapleural collection of gas. Later many observers undertook the study of the composition of pneumothorax gas, among whom are especially cited Rist and Strohl, and Dautrebande and Spehl. The former concluded that gaseous exchange through the pleural membranes occurs by diffusion, with a rapidity proportional to a particular coefficient for each gas and to the difference in partial pressures of this gas on either side of the pleural membrane. Thus, at the end of a certain period of time, a certain constant composition of the intrapleural gas is maintained. Dautrebande and Spehl found that it is possible to make the carbon dioxide in the cavity vary by producing a state of acidosis or alkalosis. They also observed in one case with much impaired circulation that the intrathoracic air showed higher CO_2 tension than that of the venous blood and much higher than that of the alveolar air, which would indicate the intensity of tissue respiration as a factor. Resorption is influenced by the state of the pleura, being delayed when the pleura is damaged, and also by the state of diaphragmatic function. *Pleural Absorption of Liquids:* Starling, together with Tulby and Leathes, has studied this, and does not consider that the physical laws of osmosis explain all. It is well known that local vasodilatation augments absorption, whereas vasoconstriction retards it. Starling and his coworkers appear to have shown that absorption of fluids occurs by way of the blood, not the lymph; the same is true of soluble crystalloid matter, which is rapidly absorbed, while colloidal solutions, such as carmine, pass into the lymph channels and are absorbed very slowly. Certain dyes, such as Sudan-red and Biebrich's Scharlach-R are hardly absorbed at all. *Absorption of Albuminoids:* When a bloody exudate coagulates in the pleura the serum is rapidly absorbed. In experimental animals the injection of albuminoid matter into the pleural cavity is followed by reactions. With blood-serum and muscle peptone these are slight; with boiled cow's milk the reactions are quite intense, causing chills, muscle-spasms and slight shock; the most severe reactions of all are caused by casein. All these manifestations can be attenuated or prevented by a prior injection of pilocarpine. It is debated whether they are a true protein shock or the result of chemical irritation of the pleura. *Absorption of Oils:* Cordier noted that twenty-three hours after an injection of gomenolated oil its volume had decreased about 20 per cent. Binet and Verne made studies with olive

oil, freed of fatty acids and colored by Sudan or Scharlach-R, also with iodized oil, in rabbits. It diffuses quickly, and is well visualized by X-ray. Its gradual diminution and disappearance were noted. Histological examination of the pleural membrane showed the appearance of little villosities about which were collected globules of oil. Fat globules were observed in the pulmonary tissues but not in the endothelial cells. Practically all the coloring matter remained in the pleural cavity, generally giving rise to a serous exudate.—*Le pouvoir absorbant de la plèvre, L. Binet, Presse Méd., January 2, 1926, no. 1, 6.*—*(A. P.)*

Sensitiveness of Pleura and Pericardium.—Under the guidance of the thoracoscope dull and pointed probes were introduced into the pleural cavity in order to test the sensitivity of the pleura and pericardium. The following results were obtained: The visceral pleura is not sensitive to touch, strong pressure, nor superficial pricks. Deep pricks sometimes cause slight pain which is not definitely localized. Cold and heat are not felt. Slight touches are not registered by the costal pleura. Pressure and pricks are always felt, but without localization. Only stronger degrees of heat are noticed as pain. The central part of the diaphragmatic pleura is insensible to heat. Pressure and puncture cause pains in the neck and in the shoulder region of the same side. The marginal parts of the diaphragmatic pleura register stimuli as slight pain in the lower parts of the thorax, and in the epigastric region. Heat and cold are not distinguished. Pressure upon the left apex of the heart causes a disagreeable sensation on the inner side of the left arm. Strong pressure on the right side of the pericardium produces a disagreeable sensation around the 6th rib, medially, in the midclavicular line. A chronically inflamed pericardium was insensible to all stimuli.—*Sensibilitätsprüfungen von Pleura und Perikard, Unverricht, Klin. Wchnschr., April 30, 1927, vi, 855.*—*(M. P.)*

Artificial Paralysis of Diaphragm.—Artificial paralysis of the diaphragm is considered absolutely indicated in unilateral processes of the lower lobe, especially in bronchiectasis, as well as in small unilateral apical and upper-lobe cavities of predominantly fibrotic nature. It is allowable in bilateral processes in which no other mechanical therapy is possible. It is useless with large cavities. As an adjunct in artificial pneumothorax it should not be used, but it has a place after the discontinuance of the pneumothorax. As an adjunct in plastic operations it appears to be of value. Since the relaxation of the diaphram is maximal only after three months, the actual value of the procedure will only be discernible at this time.—*Zur Frage der künstlichen Zwerchfellähmung, H. Jessen, Beitr. z. Klin. d. Tuberk., 1926, lxiv, 613.*—*(H. J. C.)*

Surgical Paralysis of Diaphragm.—To determine the ventilation of the apical and basal parts of the lung before and after phrenic exairesis, the author performed experiments on chloroformed cats. Normally there is a difference of pressure of 20 mm. between inspiration and expiration in the pleural space over the apex, while over the base this difference is 50 mm. If costal breathing is excluded by the use of adhesive plaster, the pressure difference over the apices was only 5 and over the base 60 mm. Therefore, apical breathing is in great part costal, while basal breathing is diaphragmatic. In cats, three months after unilateral paralysis of the diaphragm, there was found an increased pressure of the paralyzed as compared with the normal side, which is attributed to a marked hypertrophy of the chest musculature on the operated side, thus the lack of ventilation, due to the hemidiaphragmatic paralysis, is compensated. With exclusion of the thoracic respiration no pressure oscillations on the phrenectomy side occur. These animal experiments serve to explain the favorable influence of phrenic exairesis in unilateral tuberculosis. In adult cases of pulmonary tuberculosis with advanced disease the thoracic muscles become degenerated and are not able to compensate, and thus, in contradistinction to the animal of experiment there occurs, after phrenic exairesis, rest of the lungs. In order to reinforce the effect of exairesis it is recommended that thoracic breathing be restricted by means of broad adhesive plaster around the chest.—*Zur Frage der operativen Zwerchfellähmung. Tierversuche, Überlegungen, klinische Erfahrungen, W. Schnippenkötter, Beitr. z. Klin. d. Tuberk., 1926, lxv, 56.*—*(H. J. C.)*

Phrenic Paralysis as Result of Cervical and Thoracic Tuberculous Processes.—A case of complete right phrenic paralysis in an 11-year-old child, due to inactive tuberculosis of the cervical vertebrae, is reported. Etiologically, hilum lymph-node processes, as well as cervical lymph-node processes, come into consideration. A second case of the former type is reported. —*Über Phrenicuslähmungen durch cervicale und thorakale tuberkulöse Prozesse, Simon, Ztschr. f. Tuberk., 1926, xlvi, 50.*—*(H. J. C.)*

The Paradoxical Movements of Diaphragm.—The author constructed a model for studying the paradoxical diaphragm movement, and studies with this model led to the conclusion that the paradoxical movements of the diaphragm are essentially due to changes in intrapleural pressure. Anatomical or functional changes of the diaphragm have only a favoring but not a determining action.—*Die Entstehung der paradoxen Zwerchfellbewegung, L. Dünner and M. Mecklenburg, Ztschr. f. Tuberk., 1926, xlv, 365.*—(*H. J. C.*)

Hypotonia and Diaphragmatic Descent in Pneumothorax.—Four years ago Sergent and Marquezy drew attention to the disappearance of hepatic dulness in right-sided pneumothorax and the descent of the liver in the abdomen. Fourteen new cases are now reported, 12 of them right-sided, to illustrate diaphragmatic hypotonia and descent. Four different degrees are distinguished: (1) simple descent with preservation of form, (2) more marked descent with flattening of dome, (3) very marked descent with disappearance of dome, and (4) marked descent with inversion of the cupola. In the first type the liver is not pushed down enough to be felt, although its upper limits of dulness are lowered. Amplitude of excursion is reduced. In the second type the liver is palpable, there are small but definite pendulum movements, and in the presence of exudate Kienbock's phenomenon is observed. In the third type these phenomena are constant. The fourth type is a real dislocation, associated with inflammatory reaction and apparently always with formation of a purulent exudate. Kienbock's phenomenon is always present, but the hyperpressure may be only transitory. This diaphragmatic dislocation appears to follow rupture of adhesions, often complicated by pleuropulmonary fistula. The first two types are compatible with continuation of a therapeutic pneumothorax, the third indicates careful observation and procedure, and in the presence of the fourth one must both evacuate the exudate and apply an abdominal binder.—*L'hypotonie et la chute du diaphragme dans le pneumothorax, E. Sergent, P. Oury and Cottenot, Section d'études scientifiques de l'Oeuvre de la Tuberculose, March 13, 1926, reported in Rev. d. l. Tuberc., June, 1926, vii, 464.*—(*A. P.*)

Vital Capacity.—The vital capacity was taken on the Sanborn-Benedict metabolimeter before and after the patient breathed through a jar containing anhydrous calcium chloride. Three vital-capacity readings were taken before and three after the breathing of dry air, and the highest of these were recorded in each instance. The chloride jar was connected to a face-mask equipped with two-way valves so that only inspired air passed through the jar. Expired air is presumably always saturated with moisture at body temperature. Breathing dry air will extract more moisture from the bronchi than will room air, which already contains a certain amount of moisture. The amount of moisture is not appreciably changed after dry air is discontinued. One hundred patients, normal as to heart and lungs, were tested. The average increase of vital capacity after breathing dry air in these cases was 12.5 cc., or 0.3 per cent. A number of patients with cardiac decompensation were tested; there was an average increase of 190 cc., or 11.4 per cent. In patients with compensated cardiac lesions there was an average increase of only 35 cc., or 1.3 per cent. Patients with asthma varied in their response. Several responded with an increase before and after the injection of epinephrine hydrochloride. Others responded with an increase due to dry air and none to epinephrine hydrochloride; the response in others was just the reverse. *Conclusions:* Breathing dry air extracts enough of the moisture to increase temporarily the vital capacity in the majority of patients with bronchiolar oedema, decrease the lung volume and number of râles, and produce a sense of subjective relief. However, if the vital capacity is reduced because of bronchial obstruction not due to moisture, such as interstitial pulmonary oedema or a rigid lung due to stasis, breathing dry air causes no change. The procedure may also be used to differentiate between those patients with asthma, whose bronchial obstruction is due chiefly to moisture and not to hypertonus or hives, and thus will be selective of cases in which the patients will improve, in all probability, in a dryer climate.—*Vital Capacity: a Study of the Effect of Breathing Dry Air, R. D. Leus, Arch. Int. Med., April 15, 1927, xxxix, 475.*—(*U. E. Z.*)

Physiology of Alveolar Cell.—The lung is anatomically a complex organ and within its structure there may be found (1) lymphoid tissue, capable of reacting strongly to infection or irritation introduced from the outside through the air-passages or from within through the blood-stream; (2) a vascular-endothelial element whose cells are secretory, phagocytic and self-mobilizing; and (3) the nucleated alveolar cells, which are secretory, phagocytic and self-detachable to become dust-cells. Lung-

tissue cultures *in vitro* show that the nucleated alveolar cell gives rise to fat-containing migratory substances with the power of phagocytosis and the power of secreting a fibrinolytic ferment.—*Remarques physiologiques sur la cellule alvéolaire et sur la cellule à poussières, L. Binet, Meeting, Soc. Méd. d. Hôp., July 16, 1926, reported in Prog. Méd., July 31, 1926, no. 31, 1188.*—*(U. E. Z.)*

Alveolar Carbon Dioxide in Pulmonary Tuberculosis.—Since the carbon-dioxide tension of the alveolar air is strictly dependent on that of the arterial blood, the determination of the former gives an indication of the latter. From the examination of 50 patients the following conclusions are drawn: In fibrotic lesions, causing an impediment to the alveolar aeration, the carbon dioxide of the alveolar air is increased. In destructive, caseous lesions the carbon dioxide is low on account of the hyperventilation. Low values would constitute a grave prognostic sign.—*Étude du CO_2 alvéolaire dans la tuberculose pulmonaire, L. Bernard, L. Binet and H. R. Olivier, Meeting Soc. Méd. d. Hôp., May 6, 1926, reported in Prog. Méd., May 21, 1927, no. 21, 817.*—*(M. P.)*

Calcium Exchange in Tuberculosis.—The chief questions to be answered are: *1:* Is the tuberculous patient decalcified? *2:* Is this decalcification specific, and peculiar to tuberculosis? In the first place, one must throw out of account all studies based merely on the urinary calcium, as this can vary greatly under an identical regimen; also, the greater part of the calcium output is eliminated by the intestines, and this bears little or no relation to the urinary calcium. Comparative analysis of organs at autopsy for calcium has not given reliable results, and it has been shown that various organs and tissues yield different amounts of calcium in different physiological states. Arguments based on poor dentition of the tuberculous are still less reliable. Dental caries is no more common in the tuberculous than in other subjects under similar hygienic conditions. Studies of the blood-calcium yield no valuable information because in the absence of indications of rickets and spasmophilia, the blood-calcium remains practically constant and has no bearing on the presence or absence of decalcification. The method permitting the best appreciation of mineral exchange is that of determining the calcium balance, comparing the total ingesta with total excreta. This method is widely used in dietetics. Normally, these should be equal. It goes without saying that if the ingesta contain insufficient calcium for a normal diet, as in the tuberculous suffering from anorexia, the balance will be negative. Conversely, if one gives to the tuberculous, as Ott and others have done, an abundant diet containing 2.5 to 5 gm. of calcium a day, one can obtain a certain calcium storage from which one might deduce that in most cases there is no decalcification. Laufer has administered certain rations for three or four days, delimiting the daily stools by the carmine method, and following this with a period of analyses for three to five days. *Results:* With a normally sufficient ration Lematte and Laufer have observed a calcium deficit in the tuberculous and have concluded that one must attain a minimum of 2 gm. of alimentary calcium oxide, to preserve equilibrium, a dose distinctly above normal requirements. These tuberculous individuals, however, had active disease with progressive loss of weight. In the absence of denutrition accompanying activity, this deficit has not been found and the tuberculous individual behaves normally. Thus decalcification is associated with progressive denutrition, and not with the specific action of the bacillus. Several authors have expressed the opinion that the abundant sputum of the tuberculous contains considerable calcium. Lematte, however, has shown that the calcium content is less than for the simple bronchitic and emphysematous, varying from 2 to 10 mgm., an insignificant amount. It must also be remembered that demineralization in the tuberculous affects other mineral constituents, such as phosphorus, magnesium, sulphur, iron, etc. Further experiments show that both organic and inorganic elements combine to maintain equilibrium, and it is a mistake to pay too much attention to a single one. Laufer has produced a notable storage of CaO and P_2O_5, while there was a nitrogen deficit and the patient lost 310 gm. in a week. He has also found that if one supplies an excess of phosphorus relative to calcium, or vice versa, one favors the formation of insoluble calcium phosphate, eliminated by the intestine. The optimum is a slight excess of calcium over phosphorus. Decalcification also results in anaemic manifestations, because from 1.6 to 2 gm. of alimentary calcium is necessary for the body to utilize iron. The optimum balance is obtainable in the tuberculous only if they receive alimentation rich in calcium, especially milk. On the other hand, the action of calcium medicaments on the calcium balance, for instance, calcium carbonate, chloride, glycerophosphate, or lactophosphate, is practically nil, with the possible exception of certain cases of anorexia

in which the intake is insufficient. Other cases in which there are real indications for calcium therapy are those associated with digestive disturbance. Such cases often show a marked loss of calcium by the intestinal route, and the addition of 2.5 gm. of calcium carbonate a day to their ration notably reduces this elimination. Bismuth may have an even more marked effect. On the other hand, a tuberculous dyspeptic, losing weight on an abundant ration well provided with calcium, will often improve and gain weight on a more limited ration with less inorganic matter, but better selected. This leads us to think that alimentary medication has no real recalcifying action, but a local gastrointestinal or symptomatic one. Above all, it must be remembered that all useless treatment is harmful.—*Échanges minéraux (calciques notamment) chez les tuberculeux, M. Laufer, Rev. d. l. Tuberc., August, 1926, vii, 600.—(A. P.)*

Adrenalin Curve and Serum Calcium at High Altitudes.—Attempts to explain the climatic action of high altitudes upon the tuberculous organism as a result of a reaction of the vegetative nervous system does not lead to uniform interpretation. The adrenalin blood-pressure curve is only available in so far as the part played by the vegetative nervous system upon the circulatory organs is concerned. The results of other tests of the vegetative nervous system are frequently contradictory. The adrenalin curve alone does not permit an exclusive conclusion regarding sympathetic weakness, since there are cases in which psychogenic irritation can call forth blood-pressure and pulse changes, while adrenalin does not act thus. A definite relation between the absolute serum-calcium content and the course of the adrenalin reaction does not exist. A definite adrenalin blood-pressure curve did not occur during a two months' residence at high altitude, yet in individual cases with low serum-calcium content and a good reacting power of the vegetative nervous system there occurred an increase in the serum calcium. A relation between the grade of serum-calcium increase and the form of tuberculosis does not exist.—*Adrenalin-Blutdruckkurve und Serumkalkspiegel im Hochgebirge, M. Dugge, Beitr. z. Klin. d. Tuberk., 1926, lxv, 96.—(H. J. C.)*

Fat Metabolism of Lungs.—The differences in the morphological appearances of intravenously and intratracheally injected codliver oil, as well as ingested oil, were studied in the normal and pneumothorax-collapsed rabbits' lungs. There was histological evidence of a more rapid disappearance of the fat from the pneumothorax lung as compared to the normal lung.—*Über den Fettstoffwechsel der Lungen (mit besonderer Berücksichtigung der Pneumothoraxlunge), Rehberg, Beitr. z. Klin. d. Tuberk., 1926, lxiv, 718.—(H. J. C.)*

Blood Groups and Tuberculosis.—The blood grouping of 200 cases of pulmonary tuberculosis, with positive sputum in adults, and of 200 normal healthy individuals was determined and no significant difference in the grouping among these two classes of individuals was found. It is concluded that there does not appear to be any particular susceptibility or resistance to tuberculosis, dependent upon the class of blood grouping an individual happens to possess.—*Gibt es einen Unterschied in der Häufigkeit der einzelnen Blutgruppen bei Lungentuberkulösen und bei gesundem Menschen? J. Hollo and W. Lenard, Beitr. z. Klin. d. Tuberk., 1926, lxiv, 513.—(H. J. C.)*

Blood Groups and Tuberculosis.—The agglutination tests of Moss and Vincenta were used on 517 cases of tuberculosis, —467 pulmonary, 34 bone, and 14 miscellaneous cases. In order to avoid errors no fresh test sera were used, the dilution was two to four, and the red blood corpuscle suspension was 5 per cent. The unity of blood grouping was unaltered for the same individual in repeated tests, and neither medication nor tuberculosis altered this. A special disposition to tuberculosis was noted for group 2, and a resistance in group 4, a tendency to more frequent and more marked haemorrhage for groups 1 and 4, and a lesser tendency for group 2.—*Über die Beziehungen zwischen Blutgruppen und Tuberkulose. Ein Beitrag zur Frage der Bedeutung der Konstitution für die Tuberkulose, M. M. Alperim, Beitr. z. Klin. d. Tuberk., 1926, lxiv, 500.—(H. J. C.)*

Blood Groups and Tuberculosis.—This study is based on observations made in 200 cases comprising ten family groups. *Conclusions:* There appears to be no evident relationship between blood groups and predisposition to tuberculosis or between blood groups and predisposition to any special form of tuberculosis.—*Gruppi ematici e predispozione alla tubercolosi, E. Sale, Tubercolosi, May, 1927, xix, 181.—(U. E. Z.)*

Blood Groups and Tuberculosis.—The object of this work is to determine the importance of the constitutional factor in disease as represented by the isoagglutinins, the blood types being generally re-

garded as an outstanding constitutional quality, and tuberculosis as a somatic disorder of traditionally important genotypic relationship. In 400 tuberculous patients the blood types were determined. *Conclusion:* No specific relationship can be established on the basis of the ordinary standards between blood type and tuberculosis. As a corollary, from the standpoint of constitution, if there is any specific relationship between tuberculosis and genotypic physiological pattern, this does not appear to include the quality of blood type.—*Blood Group in Tuberculosis, T. Raphael, O. M. Searle and T. N. Horan, Arch. Int. Med., September 15, 1927, xl, 328.—(W. I. W.)*

Phosphoric Acid of Blood in Pulmonary Disease.—An increase of phosphoric acid in extracts of the blood corpuscles can be of differential diagnostic value. This finding is, however, difficult to interpret because it occurs in a number of diseases. Two cases are reported in which high phosphoric-acid values, in the absence of positive bacillary findings, indicated pulmonary malignant tumor, which was verified in these cases by biopsy.—*Die P_2O_5 Bestimmung des Blutes bei Erkrankungen der Lunge, Vorschütz, Arch. f. klin. Chir., 1926, cxlii, 371.—(H. J. C.)*

Renal Function in Pulmonary Tuberculosis.—In patients with incipient tuberculosis the renal function as measured by the excretion of phenolsulphonphthalein is more or less normal. In more advanced cases the elimination is frequently diminished. In far-advanced cases the excretion is lower than or equal to normal in a considerable proportion of cases. In 30 per cent of these cases the elimination was 20 per cent or less, and in 3 patients it was reduced to small traces. From this it is concluded that in far-advanced tuberculosis nitrogenous substances are poorly eliminated by the kidney. A lactovegetarian diet is indicated in such patients, and a heavy meat diet should be avoided.—*Contribution à l'étude des fonctions rénales chez les tuberculeux pulmonaires par l'épreuve de la phénol-sulphone-phthaléine, C. David, Meeting, Soc. d. Méd. Paris, December 23, 1926, reported in Prog. Méd., January 15, 1927, no. 3, 107.—(B. T. McM.)*

Normal Kidney Does Not Excrete Tubercle Bacilli.—One hundred and three guinea pigs were injected with urine from male patients who had advanced active pulmonary tuberculosis. Urine to be inoculated was collected and examined as follows: The patient, not having voided for three hours prior to the time of collection, had his penis washed and then cleansed with a solution of mercurochrome, 220 soluble, 1:1000, after which he urinated into two large tubes, the first of which was discarded and the second used for analysis. The second urine was examined for sugar and albumen. A microscopic examination was made for casts, leucocytes, red blood cells, and excess of epithelial cells. If any of these elements was found the urine was not used. One ounce of accepted urine was placed in sterile centrifuge tubes and centrifugated. The sediment was mixed with 5 cc. of sterile salt solution and injected intraperitoneally into a guinea pig. Each animal so injected was examined by the pathologist at the end of six weeks, or sooner if it died. Not one of the 103 pigs so injected showed any evidence of tuberculosis. *Conclusions: 1:* The tubercle bacillus does not pass through normal renal epithelium. *2:* The tubercle bacillus appears in the urine only when tuberculous lesions exist either in the urinary tract or in the genital tract.—*Does Normal Kidney Tissue Permit the Passage of Tubercle Bacilli? W. M. Spitzer and W. W. Williams, J. Am. M. Ass., June 11, 1927, lxxxviii, 1870.—(W. I. W.)*

Biology of Tubercle Bacillus.—In a mixture of leucocytes and tubercle bacilli the latter are rapidly engulfed by the former but remain alive, while the leucocytes undergo destruction. In order to determine whether this is due to the toxins of the bacilli, the glycerol in the broth was gradually replaced by ethyl alcohol, which is known to be destructive to toxins. By successive transplants into broth, with decreasing glycerol and increasing ethyl alcohol, growth was obtained on 3 per cent ethyl alcohol without glycerol. Glycerol can also be replaced by different mono- di- and polysaccharides. Tubercle bacilli also grow in mineral-salt media. The author used for this purpose ammonium chloride 0.35, potassium phosphate 0.05, magnesium sulphate 0.02, glycerol 1.5–3.0, and distilled water 100. By gradual reduction of the glycerol in this medium growth was finally obtained with the inorganic mixture in the absence of glycerol. The purity of the growth was determined by staining methods. The atmospheric air served as carbon-dioxide source. Upon exclusion of the atmospheric carbon dioxide, growth ceased. Ammonium served as the source of energy. Similar experiments with typhoid bacilli could not be pursued to termination since the strain always died during the course of the experiments.—*Zur Biologie des Tuberkelbacillus, B. L. Masur, Centralbl. f. Bakteriol., Abt. I., Orig., 1926, xciv, 46.—(H. J. C.)*

Mutation Forms of Tubercle Bacilli.—Cases are well known in which definitely tuberculous lesions have existed without the presence, or with only a few rare forms, of tubercle bacilli. In miliary tuberculosis of the liver or spleen, also in pus from cold abscesses, it is rare to discover tubercle bacilli; likewise in certain fibroid forms of pulmonary tuberculosis. Arloing and Courmont, by the agitation of cultures on liquid media, obtain so called homogeneous cultures, only partially acid-fast. Bezançon and Philibert have adopted a different method, of fine histological study of the colonies, especially of the films which develop on the surface of glycerine-broth, a method heretofore practically neglected, although Straus, after Koch, by means of transferring a tracing of young colonies, was convinced that the bacilli were separated by an almost colorless substance or substrate. Histological sections were made of the films after fixation in absolute alcohol and paraffin inclusion. The sections were cut about 1/300 mm. in diameter and stained by both the Ziehl-Neelsen method and that of Fontes, a combination of the gram-stain, fuchsin and methylene blue. It was seen that the greater part of the film did not consist of acid-fast bacilli, and on the most recent portions they were entirely absent. The portion in contact with the broth showed numerous acid-fast bacilli, the other or superficial portion few. In the little prolongations of the film which grasp the sides of the glass they are nearly absent. The substrate or framework described is not acid-fast and takes a blue color; it may be termed *cyanophile substance*, disposed in bands and filaments, or having a striate or fibrillar structure. Where acid-fast bacilli are present they are disposed along the long diameter of this substance. Another sort of element noted consists of so called *chromophile corpuscles*, first described by Koch and later studied by Babes, Straus and Gram, and more recently by Fontes, Much, and Bezançon and Philibert. These granulations are situated within the acid-fast bacilli. Very young films show only cyanophile substance; later a few bacilli and chromophile corpuscles appear. In old cultures typical acid-fast forms are less numerous, but one finds numerous chromophile corpuscles in the meshes of the cyanophile substance. In cultures over 200 days old the veil is thick and crimped, and seems composed entirely of cyanophile substance, with indistinct striations and minute bluish granulations. The chromophile corpuscles are extremely abundant. An exceptional development appears in young colonies on glycerinated calves' spleen, where acid-fast bacilli are numerous from the beginning, with hardly any cyanophile substance. If one examines the particles and fragments which settle to the bottom of the culture, one sees a wheel-like formation, the centre or nucleus rich in acid-fast bacilli, the spokes of cyanophile substance. The notion is formed that the acid-fast bacillary form is only a transitory and ephemeral aspect of the parasite of tuberculosis, and that the metachromatic corpuscles represent the substrate of the toxin of the microörganism. They suggest spores, but are less resistant to heat. They undoubtedly possess elements of resistance and possibly have to do with reproduction. Old cultures are crammed with them. That non-acid-fast forms of the tubercle bacillus exist seems established, and Vaudremer has described polymorphous filterable forms. In fact, in the products of human tuberculous lesions, such as sputum, by using the Fontes method one may recognize granulations and chromophile corpuscles, and also in tuberculous pus. These have been considered degenerated forms. Their pathogenesis was demonstrated by Fontes by inoculation of a guinea pig with the filtrate of dilute tuberculous pus, producing at the end of two weeks a lymphadenitis and granular spleen without discoverable acid-fast bacilli. Reinoculation of a portion of the spleen produced lesions containing bacilli. More recently Calmette and Valtis inoculated filtered sputum, which on second animal passage produced actual tuberculosis. Thus from the botanical viewpoint, the parasite of tuberculosis seems not unlike that of actinomycosis in its polymorphic structure, and contagion seems possible even in the absence of acid-fast bacilli.—*Le bacilli acido-résistant n'est qu'une des formes du parasite de la tuberculose, F. Bezançon and A. Philibert, Presse Méd., January 9, 1926, no. 3, 22.*—(*A. P.*)

Failure to Enhance Virulence of Non-pathogenic Acid-Fast Bacilli.—An attempt to enhance the virulence of saprophytic acid-fast bacteria, including smegma bacilli, Friedmann's turtle bacilli, and timothy and butter bacilli, by inoculation into vitamine-deficiently nourished and scorbutic guinea pigs, resulted negatively. While the purely saprophytic timothy and butter bacilli caused local abscesses in the undernourished animals, the smegma and turtle tubercle bacilli can develop in foreign-body fashion in the scorbutic organism at the local focus, but without occasioning a genuine tuberculosis.—*Versuche zur Frage der Virulenzsteigerung säuerfester Saprophyten an skorbutkranken Meerschweinchen, W. Veits, Ztschr. f. Tuberk., 1926, xlvi, 372.*—(*H. J. C.*)

Agglutination of Tubercle Bacilli.—The agglutination-reaction experiments, performed by Sliwensky with warm and cold-blooded tubercle bacilli, have proved on further investigation to be nonspecific. The results of the reaction agree, in greatest part, with the Daranyi serum-flocculation test. The investigations indicate the great difficulty inherent in finding an actually specific serum reaction for tuberculosis in which the not yet completely explained colloidal serum changes do not exert an effect upon the substances of the tubercle bacillus.—*Abschliessende Mitteilungen zu der Arbeit von M. Sliwensky "Über Agglutination von Tuberkelbacillen usw." (Band 62 dieser Zeitschrift, Seite 283), H. Jannasch, Beitr. z. Klin. d. Tuberk., 1926, lxiv, 764.—(H. J. C.)*

Cultivation of Tubercle Bacilli from Microscopically Negative Material.—The reliability of various culture media was tested. With microscopically positive material Petroff's gentian-violet-egg medium gave the best results. Schiller's liquid medium has the advantage over the solid media in that the bacilli develop in shorter time. However, the most reliable results were obtained on Petroff's medium, but the most delicate method of all proved to be inoculation of the suspected material into guinea pigs.—*Zur Frage der Züchtung von Tuberkelbacillen aus mikroskopisch negativem Material, F. Schmidt and A. Sylla, Ztschr. f. Tuberk., 1926, xlv, 370.—(H. J. C.)*

"T. B.-Bacillol," New Sputum Bactericide.—A 5 per cent *T.B.-Bacillol* solution gave satisfactory results in destroying tubercle bacilli in the sputum. *T. B.-Bacillol* and *Alkalysol* and *Parmetol* are recommended for use in general practice. *Sputokrimp* and *Caporit* require further testing, but thus far have not proved efficient. A new sputum-disinfection apparatus is illustrated and described.—*Über neue Mittel zur Abtötung der Tuberkelbacillen im Sputum, K. W. Jötten and F. Sartorius, Beitr. z. Klin. d. Tuberk., 1926, lxiii, 830.—(H. J. C.)*

Tumor Due to Toxins of Tubercle Bacillus.—If tubercle bacilli in an impermeable sac be introduced into the anterior chamber of one eye, an inflammation develops not only in the eye thus treated but likewise in the other eye,—the so called sympathetic inflammation. In both eyes the reaction consists of a uveitis, with infiltration containing lymphocytes, epithelioid and giant cells and occasionally caseation. The inoculations described were made into rabbits' eyes, and a culture of human tubercle bacilli isolated from pleural fluid was used. Does this "tuberculoid-tumor" develop solely through the elaboration of a poison that continues to be formed from the imprisoned bacilli in the sac or do the nodules arise as a response to bacilli which have escaped through thin places in the bag and have thus set up typical "inoculation tuberculosis?" Histological examination does not support the latter view, since no tubercle bacilli or other bacteria were ever found in sections or after the diseased tissue was subjected to treatment with antiformin, and this despite the fact that the bag became greatly distorted in the anterior chamber. The origin of the small tumors which finally became widespread was in the uvea and choroid, from which the spread to both eyes occurred. A further proof that the "tumors" arose from a toxin and not from tubercle bacilli was the fact that at autopsy several weeks after engrafting the sac into the eye (which occurred in rabbits), there was no evidence of tuberculosis (human strain of tubercle bacillus). This is the first experimental proof, according to the author, that such changes can be set up in tissues without the presence of the exciting bacterium.—*Tumorbildung durch Fernwirkung des Tuberkelbazillus, H. Guillery, Deutsche med. Wchnschr., April 29, 1927, liii, 740.—(H. S. W.)*

Two Active Principles in Tuberculin.—What is the relationship between the lethal power of tuberculin and its capacity to produce cutaneous reactions? Experiments were carried out with the view of ascertaining whether such a relation existed and what its nature might be. Human tubercle bacilli, grown on peptonized glycerine-broth and synthetic media, were employed in the preparation of old tuberculin. The latter was separated into several lots and dialyzed in a room kept at 34° to 40°F., 240 cc. of the concentrated product being placed in each of several fish-bladder membranes and the latter suspended in 4,000 cc. of water which was changed daily. The dialysis was continued for from three to ten days and each day's diffusate was evaporated at 70°C. and tested for specific properties. The residues were then diluted (240 cc. to 1920 cc.) and tested. In all, 16 separate lots of old tuberculin were thus tested. It was found that the diffusate possessed a marked capacity to produce death when injected into tuberculous guinea pigs, but produced very slight or no cutaneous reactions, while the residue usually killed and also gave pronounced reactions in the skin. Since the lethal

factor is dialyzed and the factor producing skin reactions almost entirely withheld, there must be a considerable difference in the size of the molecule of the two active principles. When old tuberculin is precipitated with ammonium sulphate, the precipitate has the capacity to kill and to elicit skin reactions and the filtrate the capacity to kill but not to induce the cutaneous reaction. So there seems to be no doubt that tuberculin possesses these two active substances. The *skin-reacting principle* may be a complex structure containing the *lethal principle* as a necessary part. It may also be possible that the two are independent and may unite at times, or that the lethality may come about by physical absorption rather than by a chemical union. There may be found many variations in these active substances in different types of tuberculin, but at least it has been shown that the lethal power of tuberculin is an index of its skin-reacting power in tuberculous guinea pigs. It does not necessarily follow, however, that in whole tuberculin one of these substances may not indicate the value of the other.—*The Relationship of the Lethal Power to the Skin-Reacting Power of Tuberculin, M. Dorset, R. R. Henley and H. E. Moskey, J. Am. Vet. Med. Assn., July, 1927, lxxi (n.s., xxiv), 487.—(H. S. W.)*

Comparison of Routes of Administering Tuberculin.—The contention that percutaneously or intracutaneously administered tuberculin exerts a different action than that given subcutaneously was not proved. A comparison was made between intracutaneous and percutaneous reactions, using on the upper arm 0.1 cc. of dilutions of tuberculin from 1:10,000 to 1:1,000,000. Coincidently on the right arm 0.5 cc. of old tuberculin, 1:10 to 1:1,000 in glycerine, was given by inunction. Readings were made after 24 and 48 hours. In general it was found that a ten-thousandfold dose of tuberculin was required percutaneously to elicit a local reaction in comparison to the intracutaneous method. Comparing this with the necessary dose for eliciting a general reaction, it would require a one hundred-thousand greater dose percutaneously than subcutaneously.—*Studien zum Tuberkulinproblem. IX. Mitt. Über den Wirkungswert percutan gegebenen Tuberkulins, A. V. v. Frisch and K. P. v. Eiselsberg, Beitr. z. Klin. d. Tuberk., 1926, lxiv, 646.—(H. J. C.)*

Estimation of Optimum Dose of Tuberculin.—The art of tuberculin therapy lies in finding the optimum dose which will still elicit a visible reaction. It was attempted, in cases of favorable juvenile tuberculosis, to determine by means of old tuberculin the relation between the reaction course of graduated intracutaneous injections and the amount of the first subcutaneous dose essential. For intracutaneous titration 0.1 cc. of dilutions from 0.0001 to 0.000,001 or, when necessary, weaker or stronger concentrations, and two days later the twenty-fold amount of tuberculin giving the lowest positive intracutaneous reaction, was given subcutaneously. This was increased at two-day intervals with double doses until a general reaction occurred. From this the general rule was deduced that a general reaction following the subcutaneous injection of tuberculin did not occur until the tenfold dose had been reached which still produced an unquestionable positive local intracutaneous reaction. The method, rapidly and without danger, gives an insight into the allergy relations and the initial dose to be used subcutaneously in tuberculin therapy.—*Studien zum Tuberkulinproblem. VIII. Mitt. Über die klinische Verwertung der Tuberkulinintracutanreaktion, A. V. v. Frisch and K. P. v. Eiselsberg, Beitr. z. Klin. d. Tuberk., 1926, lxiv, 638.—(H. J. C.)*

Specificity of Tuberculin.—*Conclusions:* Tuberculin is specific in diagnosis, for (1) it is a reagent derived from bacilli of the same species as the infection; (2) the noninfected, whether healthy or suffering from any other disease, do not react; (3) the infected react unless protected by artificial tolerance or too exhausted to respond; (4) the local reaction shows that the patient has been infected; the general reaction shows that the tubercle bacilli are alive; the focal reaction shows the seat of the disease. Tuberculin is specific in treatment, for (1) tolerance to tuberculin and immunity to tuberculosis increase together; (2) tuberculin acts by stimulating the *vis medicatrix naturae;* (3) increasing doses of tuberculin overcome the initial sensitiveness; (4) large doses are required for prolonged good; (5) if on cessation of tuberculin the immunity lapses it may be rapidly restored on resumption; and (6) tuberculin is ineffective against streptococci and other nontuberculous infections; it is specific.—*Tuberculin: Is it a Specific? F. G. Griffths, Brit. M. J., May 7, 1927, no. 3461, 827.—(W. I. W.)*

Specificity of Tuberculin.—Since slowly absorbable substances like bacteria, liver extracts, lipoids and foreign bodies can call forth tuberculoid tissue-formation, it is unreliable to attempt to parallel, histologically,

intracutaneous lesions produced by colon bacilli with the sites of tuberculin injection as was done by Blumenberg. The colon filtrates produce only nonspecific changes, in contradistinction to old tuberculin. Even though tuberculoid tissues can be produced by various conditions and are not alone specific, yet all substances belonging to living or dead tubercle bacilli are related to tuberculosis. In this sense a positive tuberculin skin reaction is a new form of tuberculous lesion. Tuberculin is not able to produce tuberculoid tissue in tuberculosis-free organisms.—*Zur Spezifität der Tuberkulinreaktion mit besonderer Berücksichtigung ihrer histologischen Grundlage, K. Zieler, Beitr. z. Klin. d. Tuberk., 1926, lxiv, 94.*—(*H. J. C.*)

Specificity of Tuberculin.—Using tuberculin and *B. coli* vaccine the following results were obtained. Only people who had been infected with tuberculosis reacted to small amounts of tuberculin, while, on the contrary, injections with other bacterial substances (from *B. coli, dysenteriae*, etc.) resulted in positive intracutaneous reactions both in tuberculous and nontuberculous individuals. If, later, old tuberculin is injected subcutaneously in these individuals the former tuberculin and colon-bacillus sites of injection can flare up.—*Zur Spezifität der Tuberkulinreaktion, K. Zieler and J. Hämel, Beitr. z. Klin. d. Tuberk., 1926, lxiii, 991.*—(*H. J. C.*)

Nonspecificity of Tuberculin Hypersensitiveness.—Since 1913 the author has demonstrated that tuberculin hypersensitiveness occurs after treatment with dead tubercle bacilli. In infants a tuberculin hypersensitiveness was attained a number of times by preliminary treatment with *B. coli* vaccine but not with typhoid vaccine. The nonspecific appearance of tuberculin hypersensitiveness is characterized as a heterogenetic allergizing. It is believed that tuberculin, which, in itself is not an antigen, develops antigenic properties in previously treated cases given specific or nonspecific protein. After infection with tubercle bacilli there results a coincident primary and secondary allergy, which can be artificially distinguished. The nonspecific nature of the tuberculin reaction is emphasized.—*Die heterogenetische Tuberkulinallergie in ihrer Bedeutung für die Entstehung der Tuberkulinempfindlichkeit, A. Adam, Beitr. z. Klin. d. Tuberk., 1926, lxiii, 635.*—(*H. J. C.*)

Nonspecificity of Tuberculin.—In our present state of knowledge tuberculin therapy is no longer to be considered specific treatment. No better results are to be expected with tuberculin than with general protein therapy. It is immaterial whether tuberculin or some nonspecific stimulating substance is used. Tuberculin retains its value in diagnosis, although it must be recognized that under certain conditions sensitiveness to tuberculin develops without tuberculous infection. In the use of tuberculin in diagnosis more caution is required than was formerly thought necessary, and nonspecific enhancement of capacity for inflammation must be kept in mind. Tuberculin is of value in diagnosis just as is the Wassermann reaction. Neither reaction is strictly specific, but each permits diagnosis with reasonable certainty when the sources for error are recognized.—*Die Bedeutung des Tuberkulins für die Therapie und Diagnose der Tuberkulose, H. Selter, München. med. Wchnschr., April 15, 1927, lxxiv, 625.*—(*E. R. L.*)

New Experiments with Tuberculin.—The active principle of tuberculin is labile toward alkalies. The graduated addition of alkali causes a disappearance of the toxic fraction, with its reappearance upon further addition, and again disappearance.—*Neue Versuche mit Tuberkulin, P. Bergell and K. Schlapper, Beitr. z. Klin. d. Tuberk., 1926, lxiv, 203.*—(*H. J. C.*)

Influence of Light on Tuberculin.—Tuberculin solutions are markedly weakened or made inactive by light exposures with the quartz lamp in so far as their intracutaneous reacting power is concerned. This effect is noticeable especially in high dilutions and with intensive exposures to light. Concentrated tuberculin solutions were resistant to the action of light. This action of the light is due to the short wave lengths (325 $\mu\mu$).—*Der Einfluss des Lichtes auf Tuberkulin. I. Mitt., W. Hausmann, W. Neumann and K. Schuberth, Ztschr. f. Tuberk., 1926, xlvi, 32.*—(*H. J. C.*)

"Procutine."—*Procutine* or *Anticutine* causes the development, in the tuberculin postule, of substances which have the ability, on being injected together with tuberculin, of causing an increased or diminished reaction. Even though the existence of these substances, probably identical with the *Chemolysin* of Sahli, is admitted, it cannot be said that they develop with any regularity. Likewise, their specific character has not been determined and their significance in tuberculosis is still uncertain. As far as their formation and the immunobiological peculiarity in the skin in tuber-

culosis is concerned, this must remain until further studies determine whether the same reactions occur in the internal parts of the body.—*Zur Frage der Proculine, P. Wichmann, Beitr. z. Klin. d. Tuberk., 1926, xliii, 974.*—(*H. J. C.*)

Changes of Allergy in Adults.—In order to determine tuberculin hypersensitiveness in adults, mostly with tertiary pulmonary tuberculosis, tests were made with the intracutaneous method with old tuberculin during a long sanatorium residence. As a whole, the varying sensitiveness of an individual does not change, either in the beginning, during the course of or at the end of the disease; it is independent of the qualitative and incidental course. There is an individual maximum, which, at its height, according to intensity and extent, is closely bound up with the primary-secondary process; temporary diminution by intercurrent diseases is later followed by return to the old level. A study of the seasonal variations of tuberculin sensitiveness revealed that the diminution of tuberculin sensitiveness noted during the early months of the year parallels the general resistance of the human organism, with return to a higher level in late spring and summer.—*Läufende Allergieprüfungen während längeren Heilstättenaufenthaltes bei meist tertiären Tuberkulösen und jahreszeitliche Schwankungen der Tuberkulinempfindlichkeit, W. Schnippenkötter, Beitr. z. Klin. d. Tuberk., 1926, lxv, 41.*—(*H. J. C.*)

Variations in Tuberculin Hypersensitiveness.—This is a continuation of earlier studies recorded. While, as a whole, no single rule was found governing the variations of tuberculin hypersensitiveness in children, it was noted that on certain days there was a uniform agreement in the increased or diminished reaction in the majority of the injected children. Technical errors were carefully excluded. Influences of the disease process could hardly be so general and were not discernible clinically. Weather conditions or "cosmic influences" were considered, but a comparison of tuberculin curves with the curves of the meteorological institute yielded nothing. However, certain unrecorded conditions of this nature, it is suggested, may play a rôle.—*Über Schwankungen der Tuberkulinempfindlichkeit (II Mitt.), K. Ossoinig, Beitr. z. Klin. d. Tuberk., 1926, lxiv, 652.*—(*H. J. C.*)

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